

DERWENT-ACC-NO: 2002-257708  
DERWENT-WEEK: 200230  
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TITLE: Microminiaturized trench capacitor production in  
semiconductor device  
manufacture includes formation of top and bottom ruthenium  
electrodes and a  
tantalum pentoxide dielectric film

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PATENT-FAMILY:

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DESIGNATED-STATES: CN JP KR US AT BE CH CY DE DK ES FI FR  
GB GR IE IT LU MC NL P  
T SE

APPLICATION-DATA:

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INT-CL (IPC): H01L021/8242; H01L027/108

ABSTRACTED-PUB-NO: WO 200215275A  
BASIC-ABSTRACT: NOVELTY - Process involves making a  
circular opening in an  
interlayer insulating film, forming a lower ruthenium  
electrode by low-pressure  
remote sputtering, and depositing a ruthenium on the side  
wall of a deep hole.

After the ruthenium film deposited on the top face of the interlayer insulating film is removed, a dielectric film, e.g., Ta<sub>2</sub>O<sub>5</sub>, is deposited. Then an upper ruthenium electrode is deposited.

DETAILED DESCRIPTION - To obtain the upper ruthenium electrode, Ru (EtCp)<sub>2</sub> is deposited by chemical vapor deposition, in which the material is transferred by bubbling.

USE - Production of a microminiaturized trench capacitor.

ADVANTAGE - Under a condition (reaction rate-limiting condition) that the rate of deposition of the ruthenium film depends on the forming temperature, an upper ruthenium electrode with high coverage can be formed.

CHOSEN-DRAWING: Dwg.1d/9

TITLE-TERMS:

MICROMINIATURE TRENCH CAPACITOR PRODUCE SEMICONDUCTOR  
DEVICE MANUFACTURE  
FORMATION TOP BOTTOM RUTHENIUM ELECTRODE TANTALUM  
DIELECTRIC FILM

DERWENT-CLASS: L03 U11 U12

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